

THE ASTROPHYSICAL JOURNAL

INDEX TO VOLUME 317, PARTS 1 AND 2

1987 JUNE 1 AND JUNE 15

AARONSON, M. Isophotal Diameters of Cluster Spirals (Abstract of Paper in 1987 July Suppl.). *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould.* 317, 1002, 77-B5 (1987)

ABT, HELMUT A. Implications for Solar-Type Binary Statistics of the Morbey-Griffin Improved Binary Analysis. *Helmut A. Abt.* 317, 353, 67-F11 (1987)

Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. *Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt.* 317, 787, 74-F1 (1987)

ADAMS, JAMES H., JR. Very High Energy Gamma-Ray Spectroscopy. *David Eichler and James H. Adams, Jr.* 317, 551, 70-A1 (1987)

ADAMS, NIGEL G. On the Synthesis of $c\text{-C}_2\text{H}_2$ in Interstellar Clouds. *Nigel G. Adams and David Smith.* 317, L25, 71-C1 (1987)

AJELLO, J. M. Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. *J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps.* 317, 964, 76-F5 (1987)

ARENKT, RICHARD. Multiple Shell Planetary Nebulae. I. Morphologies and Frequency of Occurrence (Abstract of Paper in 1987 July Suppl.). *You-Hua Chu, George H. Jacoby, and Richard Arendt.* 317, 1002, 77-B5 (1987)

BAHCALL, JOHN H. Dust Distribution in Spiral Galaxies. *Nikolaos D. Kylafis and John H. Bahcall.* 317, 637, 73-A13 (1987)

BAIERLEIN, R. Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. *F. J. Vrba, R. Baierlein, and W. Herbst.* 317, 207, 66-C4 (1987)

BAILYN, CHARLES D. Compact X-Ray Binaries in Hierarchical Triples. II. Separation of the Inner Binary. *Charles D. Bailyn.* 317, 737, 74-B3 (1987)

BALIUNAS, S. L. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn.* 317, L86, 78-D4 (1987)

BALL, R. Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody.* 317, L63, 78-B11 (1987)

BARDEN, SAMUEL C. Detection of a BY Draconis-like Binary Companion to the Contact Binary XY Leonis. *Samuel C. Barden.* 317, 333, 67-E4 (1987)

BARKER, E. S. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Levreault.* 317, 355, 67-F14 (1987)

BASART, J. P. Temperature and Emission-Measure Distributions for Several Planetary Nebulae. *J. P. Basart and C. T. Daub.* 317, 412, 68-D14 (1987)

BASH, F. N. The Correlation of Spiral Arm Molecular Clouds with Cold Atomic Hydrogen. *W. L. Peters and F. N. Bash.* 317, 646, 73-B8 (1987)

BASTIEN, PIERRE. Polarization, Jets, and the Distribution of Circumstellar Dust around T Tauri Stars and Other Young Infrared Sources. *Pierre Bastien.* 317, 231, 66-D12 (1987)

BENSADOUN, MARC. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bensadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky.* 317, L45, 78-A9 (1987)

BERSANELLI, MARCO. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bensadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky.* 317, L45, 78-A9 (1987)

BLACK, JOHN H. Molecules at Early Epochs. II. H₂ and CO toward PHL 957. *John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz.* 317, 442, 68-G2 (1987)

BLOEMEN, HANS. High-Energy Gamma Rays Probing Cosmic-Ray Spectral Differences throughout the Galaxy. *Hans Bloemen.* 317, L15, 71-B7 (1987)

BÖHM-VITENSE, ERIKA. Theory of Transition-Layer Emission Measures and Coronae. *Erika Böhm-Vitense.* 317, 750, 74-C2 (1987)

BOPP, BERNARD W. "Marginal" BY Draconis Stars. *Bernard W. Bopp.* 317, 781, 74-E8 (1987)

BOOTH, G. Isophotal Diameters of Cluster Spirals (Abstract of Paper in 1987 July Suppl.). *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould.* 317, 1002, 77-B5 (1987)

BOYD, L. J. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook.* 317, L29, 71-C4 (1987)

BRAINERD, J. Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. *J. Brainerd and F. K. Lamb.* 317, L33, 71-C8 (1987)

BRIGHMAN, D. R. The Hydrogen Molecular Ion in an Arbitrary Homogeneous Magnetic Field. *D. R. Brighman and J. M. Wadehra.* 317, 865, 75-D14 (1987)

BROWN, JEFFERY A. Carbon-to-Nitrogen Ratios along the Evolutionary Sequence of M67. *Jeffery A. Brown.* 317, 701, 73-F7 (1987)

BROWN, M. E. The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. *M. E. Brown and P. J. E. Peebles.* 317, 588, 72-E6 (1987)

BRUHWELLER, FREDERICK C. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. *Frederick C. Bruhweller, Daniel A. Klingensmith III, Theodore R. Gull, and Sabatino Sofia.* 317, 152, 65-E11 (1987)

BURBIDGE, E. MARGARET. Spectrophotometry of Six Broad Absorption Line QSOs. *Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith.* 317, 460, 69-A7 (1987)

CASSINELLI, J. P. Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison.* 317, 290, 67-B1 (1987)

CASTAÑEDA, HECTOR O. Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda.* 317, 676, 73-D10 (1987)

Evidence for Turbulence in H II Regions. *C. R. O'Dell and Hector O. Castañeda.* 317, 686, 73-E6 (1987)

CHAFFEE, FREDERIC H., JR. Molecules at Early Epochs. II. H₂ and CO toward PHL 957. *John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz.* 317, 442, 68-G2 (1987)

CHIUHE, TZIHONG. The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. *Tzihong Chiueh and Ellen G. Zweibel.* 317, 900, 76-A7 (1987)

CHU, YOU-HUA. Multiple Shell Planetary Nebulae. I. Morphologies and Frequency of Occurrence (Abstract of Paper in 1987 July Suppl.). *You-Hua Chu, George H. Jacoby, and Richard Arendt.* 317, 1002, 77-B5 (1987)

COCHRAN, A. L. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Levreault.* 317, 355, 67-F14 (1987)

CORNELL, M. E. Isophotal Diameters of Cluster Spirals (Abstract of Paper in 1987 July Suppl.). *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould.* 317, 1002, 77-B5 (1987)

COWIE, L. L. Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky.* 317, 593, 72-E11 (1987)

COWIE, LENNOX L. The Distribution of Gas and Galaxies around the Distant Quasar PKS 1614 + 051. *Esther M. Hu and Lennox L. Cowie.* 317, L7, 71-A11 (1987)

COWSIK, R. Dark Matter in the Universe: Massive Neutrinos Revisited.

R. Cowsik and P. Ghosh. 317, 26, 64-C4 (1987)

COX, ARTHUR N. Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell. 317, 303, 67-B14 (1987)

DALGARNO, A. Oxygen Chemistry of Shocked Interstellar Clouds. II. Effects of Nonthermal Internal Energy on Chemical Evolution. M. M. Graff and A. Dalgarno. 317, 432, 68-F6 (1987)

DAUB, C. T. Temperature and Emission-Measure Distributions for Several Planetary Nebulae. J. P. Basart and C. T. Daub. 317, 412, 68-D14 (1987)

DAVIDSON, KRIS. The Relation between Apparent Temperature and Mass-Loss Rate in Hypergiant Eruptions. Kris Davidson. 317, 760, 74-C12 (1987)

DAVILA, JOSEPH M. Heating of the Solar Corona by the Resonant Absorption of Alfvén Waves. Joseph M. Davila. 317, 514, 69-E4 (1987)

DE AMICI, GIOVANNI. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. George F. Smoot, Marc Bensadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky. 317, L45, 78-A9 (1987)

DECHEIR, R. Star Formation in the Magellanic Irregular Galaxy NGC 4449. Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher. 317, 180, 66-A3 (1987)

DELFINO, F. Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abel 2218. R. B. Partridge, R. A. Perley, N. Mandolesi, and F. Delphino. 317, 112, 65-B11 (1987)

DEUPREE, ROBERT G. The Core Helium Flash and Surface Abundance Anomalies. Robert G. Deupree and Richard K. Wallace. 317, 724, 74-A4 (1987)

DE ZEEUW, P. T. Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. P. T. de Zeeuw, C. Hunter, and M. Schwarzschild. 317, 607, 72-F11 (1987)

DICKEY, J. M. 1.4 GHz Continuum Sources in the Cancer Cluster. E. E. Salpeter and J. M. Dickey. 317, 102, 65-B1 (1987)

DINERSTEIN, H. L. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. 317, 355, 67-F14 (1987)

DIJORGOSKI, S. Discovery of Three Obscured Globular Clusters. S. Djorgoski. 317, L13, 71-B4 (1987)

DOMINGUEZ-TENREIRO, R. Antimatter and Light Element Yields: Could Dark Matter be Baryonic? R. Dominguez-Tenreiro and G. Yip. 317, L1, 71-A4 (1987)

DOMINY, JAMES F. Carbon (¹²C/¹³C) and Oxygen (¹⁶O/¹⁷O) Isotopic Ratios in Seven Evolved Stars. James F. Dominy and George Wallerstein. 317, 810, 74-G11 (1987)

DOWNES, R. A. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. 317, 355, 67-F14 (1987)

DRESSLER, ALAN. The $D_4 - \Sigma$ Relation for Bulges of Disk Galaxies: A New, Independent Measure of the Hubble Constant. Alan Dressler. 317, 1, 64-A7 (1987)

DUNAWAY, M. H. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. 317, L29, 71-C4 (1987)

DUNCAN, DOUGLAS K. The Lithium Abundance in Halo Stars. L. M. Hobbs and Douglas K. Duncan. 317, 796, 74-F10 (1987)

DUPREE, A. K. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn. 317, L86, 78-D4 (1987)

EICHLER, DAVID. Very High Energy Gamma-Ray Spectroscopy. David Eichler and James H. Adams, Jr. 317, 551, 70-A1 (1987)

FISHER, GEORGE H. Explosive Evaporation in Solar Flares. George H. Fisher. 317, 502, 69-D6 (1987)

FITCHETT, MICHAEL. Substructure in the Coma Cluster. Michael Fitchett and Rachel Webster. 317, 653, 73-C1 (1987)

FOLTZ, CRAIG B. Molecules at Early Epochs. II. H₂ and CO toward PHL 957. John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz. 317, 442, 68-G2 (1987)

The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnshek. 317, 450, 68-G10 (1987)

FORBES, T. G. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado. 317, 956, 76-E8 (1987)

FORD, HOLLAND C. Dynamics of the Outer Disk and Halo of M31. Richard Nolthenius and Holland C. Ford. 317, 62, 64-E13 (1987)

FOWLER, WILLIAM A. Gamma-Ray Constraints on ²³Na Yields in Nova Explosions. J. C. Higdon and William A. Fowler. 317, 710, 73-G2 (1987)

FUSHIKI, IKKO. S-Matrix Calculation of the Triple-Alpha Reaction. Ikko Fushiki and D. Q. Lamb. 317, 368, 68-A1 (1987)

GARDEN, RON. Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. T. R. Geballe and Ron Garden. 317, L107, 78-E9 (1987)

GARNETT, D. R. The Composition Gradient across M81. D. R. Garnett and G. A. Shields. 317, 82, 64-G7 (1987)

The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. 317, 355, 67-F14 (1987)

GARY, DALE E. Multifrequency Observations of a Solar Active Region during a Partial Eclipse. Dale E. Gary and G. J. Hurford. 317, 522, 69-E12 (1987)

GEBALLE, T. R. Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. T. R. Geballe and Ron Garden. 317, L107, 78-E9 (1987)

GENET, R. M. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. 317, L29, 71-C4 (1987)

GHOSH, P. Dark Matter in the Universe: Massive Neutrinos Revisited. R. Cowsik and P. Ghosh. 317, 26, 64-C4 (1987)

RIES, D. R. The Kinematical and Binary Properties of Association and Field O Stars (Abstract of Paper in 1987 July Suppl.). D. R. Ries. 317, 1003, 77-B6 (1987)

GRAFF, M. M. Oxygen Chemistry of Shocked Interstellar Clouds. I. Rate Constants for Thermal and Nonthermal Internal Energy Distributions. A. F. Wagner and M. M. Graff. 317, 423, 68-E11 (1987)

Oxygen Chemistry of Shocked Interstellar Clouds. II. Effects of Nonthermal Internal Energy on Chemical Evolution. M. M. Graff and A. Dalgarno. 317, 432, 68-F6 (1987)

GRAPS, A. Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps. 317, 964, 76-F5 (1987)

GRASDALEN, G. L. CS Observations of L1551: No Rotating Disk. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdalen. 317, L95, 78-D13 (1987)

GRIMM, R. F. On the Reality of Certain Spectroscopic Orbits. C. L. Morbey and R. F. Grimm. 317, 343, 67-F1 (1987)

GUINAN, E. F. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. 317, L29, 71-C4 (1987)

Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn. 317, L86, 78-D4 (1987)

GULL, THEODORE R. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. Frederick C. Bruhweiler, Daniel A. Klinglesmith III, Theodore R. Gull, and Sabatino Sofia. 317, 152, 65-E11 (1987)

HALL, D. N. B. Radial Velocities of Late-Type Stars in the Galactic Center. K. Sellgren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville. 317, 881, 75-F5 (1987)

HALL, D. S. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. 317, L29, 71-C4 (1987)

HANTZIOS, PANAYIOTIS A. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydriæ. Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletris, R. Kent Honeycutt, and Eric M. Schlegel. 317, 765, 74-D3 (1987)

HARKNESS, R. P. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. 317, 355, 67-F14 (1987)

HARPER, D. A. Star Formation in the Magellanic Irregular Galaxy NGC 4449. Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher. 317, 180, 66-A3 (1987)

HARTMANN, L. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn. 317,

L86, 78-D4 (1987)

HARVEY, P. M. A Near-Infrared Study of the NGC 6334-IV Region. *P. M. Harvey, A. R. Hyland, and S. M. Straw.* 317, 173, 65-G8 (1987)

HAWKINS, ISABEL. The $^{12}\text{C}/^{13}\text{C}$ Isotope Ratio of the Interstellar Medium in the Neighborhood of the Sun. *Isabel Hawkins and Michael Jura.* 317, 926, 76-C5 (1987)

HAYASHI, CHUSHIRO. The Equilibria of Rotating Isothermal Clouds. *Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi.* 317, 830, 75-B5 (1987)

HENRICHES, HUB F. Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. *Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs.* 317, 389, 68-B11 (1987)

HENRIKSEN, M. Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky.* 317, 593, 72-E11 (1987)

HENSON, G. D. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook.* 317, L29, 71-C4 (1987)

HERBST, W. Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. *F. J. Vrba, R. Baierlein, and W. Herbst.* 317, 207, 66-C4 (1987)

HIGDON, J. C. Gamma-Ray Constraints on ^{22}Na Yields in Nova Explosions. *J. C. Higdon and William A. Fowler.* 317, 710, 73-G2 (1987)

HOBBS, L. M. The Lithium Abundance in Halo Stars. *L. M. Hobbs and Douglas K. Duncan.* 317, 796, 74-F10 (1987)

HOLLWEG, JOSEPH V. Incompressible Magnetohydrodynamic Surface Waves: Nonlinear Aspects. *Joseph V. Hollweg.* 317, 918, 76-B11 (1987)

HONEYCUTT, R. KENT. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. *Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel.* 317, 765, 74-D3 (1987)

HOVESTAD, D. The Mean Ionic Charge of Silicon in ^3He -rich Solar Flares. *A. Luhn, B. Klecker, D. Hovestad, and E. Möbius.* 317, 951, 76-E2 (1987)

HOVESTADT, D. Calculation of the Mean Equilibrium Charges of Energetic Ions after Passing through a Hot Plasma. *A. Luhn and D. Hovestadt.* 317, 852, 75-D1 (1987)

HOWARTH, IAN D. Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. *Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs.* 317, 389, 68-B11 (1987)

HU, ESTHER M. The Distribution of Gas and Galaxies around the Distant Quasar PKS 1614 + 051. *Esther M. Hu and Lennox L. Cowie.* 317, L7, 71-A11 (1987)

HUNTER, C. Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. *P. T. de Zeeuw, C. Hunter, and M. Schwarzschild.* 317, 607, 72-F11 (1987)

HUNTER, DEIDRE A. Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher.* 317, 180, 66-A3 (1987)

HURFORD, G. J. Multifrequency Observations of a Solar Active Region during a Partial Eclipse. *Dale E. Gary and G. J. Hurford.* 317, 522, 69-E12 (1987)

HUTERS, A. F. A New Constraint on the Galactic Plane ^{26}Al Distribution. *C. J. MacCollum, A. F. Huters, P. D. Stang, and M. Leventhal.* 317, 877, 75-F1 (1987)

HYLAND, A. R. A Near-Infrared Study of the NGC 6334-IV Region. *P. M. Harvey, A. R. Hyland, and S. M. Straw.* 317, 173, 65-G8 (1987)

IBEN, IKKO, JR. On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. *Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambé, and Alexander V. Tutukov.* 317, 717, 73-G11 (1987)

ISHIKAWA, SHIN-ICHI. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito.* 317, L111, 78-E14 (1987)

ITOH, NAOKI. Viscosity of Dense Matter. *Naoki Itoh, Yasuharu Kohyama, and Hideo Takeuchi.* 317, 733, 74-A13 (1987)

JACOBSON, A. S. Gamma-Ray Burst Localization by HEAO 3. *R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson.* 317, 846, 75-C7 (1987)

JACOBY, GEORGE H. Multiple Shell Planetary Nebulae. I. Morphologies and Frequency of Occurrence (Abstract of Paper in 1987 July Suppl.). *You-Hua Chu, George H. Jacoby, and Richard Arendt.* 317, 1002, 77-B5 (1987)

JEWITT, D. C. Surface Brightness Profiles of 10 Comets. *D. C. Jewitt and Karen J. Meech.* 317, 992, 77-A7 (1987)

JUNKKARINEN, VESA T. Spectrophotometry of Six Broad Absorption Line QSOs. *Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith.* 317, 460, 69-A7 (1987)

JURA, MICHAEL. The $^{12}\text{C}/^{13}\text{C}$ Isotope Ratio of the Interstellar Medium in the Neighborhood of the Sun. *Isabel Hawkins and Michael Jura.* 317, 926, 76-C5 (1987)

KAFATOS, MINAS. Supershells and Propagating Star Formation. *Richard McCray and Minas Kafatos.* 317, 190, 66-B1 (1987)

KAIFU, NORIO. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito.* 317, L111, 78-E14 (1987)

Laboratory Detection and Astronomical Identification of a New Free Radical $\text{CCS}^3\Sigma^-$. *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu.* 317, L115, 78-F3 (1987)

Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi.* 317, L119, 78-F7 (1987)

KAITCHUCK, RONALD H. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. *Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel.* 317, 765, 74-D3 (1987)

KAKALETRIS, PANAGIOTIS. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. *Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel.* 317, 765, 74-D3 (1987)

KALLMAN, TIMOTHY R. Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. *Timothy R. Kallman, Richard McCray, and G. Mark Voit.* 317, 746, 74-B12 (1987)

KASHLINSKY, A. Gravitational Clustering and the Origin of the Correlation Function of Clusters of Galaxies. *A. Kashlinsky.* 317, 19, 64-B11 (1987)

KASUGA, TAKASHI. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito.* 317, L111, 78-E14 (1987)

KATZ, J. I. An Instability of Radiative Acceleration. *J. I. Katz.* 317, 264, 66-G3 (1987)

KATZ, NEAL. Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński.* 317, 11, 64-B3 (1987)

KAWAGUCHI, KENTAROU. Laboratory Detection and Astronomical Identification of a New Free Radical $\text{CCS}^3\Sigma^-$. *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu.* 317, L115, 78-F3 (1987)

Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi.* 317, L119, 78-F7 (1987)

KEMP, J. C. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook.* 317, L29, 71-C4 (1987)

KEMP, JAMES C. Photometry of SS 433 over 7 Years: Study of Two Periodicities. *Tsvi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson.* 317, 824, 75-A13 (1987)

KIDMAN, RUSSELL B. Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell.* 317, 303, 67-B14 (1987)

KIGUCHI, MASAYOSHI. The Equilibria of Rotating Isothermal Clouds. *Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi.* 317, 830, 75-B5 (1987)

KIRSHNER, R. P. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Levraut.* 317, 355, 67-F14 (1987)

KLECKER, B. The Mean Ionic Charge of Silicon in ^3He -rich Solar Flares. *A. Luhn, B. Klecker, D. Hovestad, and E. Möbius.* 317, 951, 76-E2 (1987)

KLEINMANN, S. G. Radial Velocities of Late-Type Stars in the Galactic Center. *K. Sellgren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville.* 317, 881, 75-F5 (1987)

KLINGLESMITH, DANIEL A., III. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. *Frederick C. Bruhweiler, Daniel A. Klinglesmith III, Theodore R. Gull, and Sabatino Sofia.* 317, 152, 65-E11 (1987)

KOGUT, ALAN. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Be-*

nsadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky. *317*, L45, 78-A9 (1987)

KOHYAMA, YASUHARU. Viscosity of Dense Matter. Naoki Itoh, Yasuharu Kohyama, and Hideo Tekeuchi. *317*, 733, 74-A13 (1987)

KRAUS, D. J. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. *317*, L29, 71-C4 (1987)

KRISHNA SWAMY, K. S. Statistical Equilibrium in Cometary C₂. IV. A 10 Level Model Including Singlet-Triplet Transitions. K. S. Krishna Swamy and C. R. O'Dell. *317*, 543, 69-G7 (1987)

KYLAFIS, NIKOLAOS D. Dust Distribution in Spiral Galaxies. Nikolaos D. Kyllafis and John H. Bahcall. *317*, 637, 73-A13 (1987)

LAMB, D. Q. S-Matrix Calculation of the Triple-Alpha Reaction. Ikko Fushiki and D. Q. Lamb. *317*, 368, 68-A1 (1987)

LAMB, F. K. Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. *J. Brainerd and F. K. Lamb*. *317*, L33, 71-C8 (1987)

LEE, MAN HOI. Thermal Emission from Bok Globules. Man Hoi Lee and C. Rogers. *317*, 197, 66-B8 (1987)

LEIBOWITZ, ELIA M. Photometry of SS 433 over 7 Years: Study of Two Periodicities. Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson. *317*, 824, 75-A13 (1987)

LETAW, JOHN R. Can Distributed Acceleration Explain the Cosmic-Ray ¹⁵N Abundance? John R. Letaw. *317*, L69, 78-C3 (1987)

LEVENTHAL, M. A New Constraint on the Galactic Plane ²⁶Al Distribution. C. J. MacCullum, A. F. Huters, P. D. Stang, and M. Leventhal. *317*, 877, 75-F1 (1987)

LEVIN, STEVE. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. George F. Smoot, Marc Bersanelli, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky. *317*, L45, 78-A9 (1987)

LEVREAU, R. M. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Levreault. *317*, 355, 67-F14 (1987)

LINDBLOM, LEE. The Role of the Viscous Secular Instability in Rotating Neutron Stars. Lee Lindblom. *317*, 325, 67-D9 (1987)

LINFIELD, ROGER. VLBI Observations of the 3C 111 Jet. Roger Linfield. *317*, 121, 65-C7 (1987)

LING, J. C. Gamma-Ray Burst Localization by HEAO 3. R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson. *317*, 846, 75-C7 (1987)

LIPANI, N. A. The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. M. Morini, N. A. Lipani, and D. Molteni. *317*, 145, 65-E3 (1987)

LO, K. Y. Molecular Spiral Structure in M51. K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody. *317*, L63, 78-B11 (1987)

LOCKWOOD, J. A. Interplanetary Radial Cosmic-Ray Gradients and Their Implication for a Possible Large Modulation Effect at the Heliospheric Boundary. W. R. Webber and J. A. Lockwood. *317*, 534, 69-F11 (1987)

LOREN, R. B. L1689N: Misalignment between a Bipolar Outflow and a Magnetic Field. Alwyn Wootten and R. B. Loren. *317*, 220, 66-D1 (1987)

LUCIANI, J. F. On the Antonov Criterion for Gravothermal Instability. J. F. Luciani and R. Pellat. *317*, 241, 66-E8 (1987)

LUHN, A. Calculation of the Mean Equilibrium Charges of Energetic Ions after Passing through a Hot Plasma. A. Luhn and D. Hovestadt. *317*, 852, 75-D1 (1987)

The Mean Ionic Charge of Silicon in ³He-rich Solar Flares. A. Luhn, B. Klecker, D. Hovestadt, and E. Möbius. *317*, 951, 76-E2 (1987)

MACCULLUM, C. J. A New Constraint on the Galactic Plane ²⁶Al Distribution. C. J. MacCullum, A. F. Huters, P. D. Stang, and M. Leventhal. *317*, 877, 75-F1 (1987)

MACHADO, M. E. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado. *317*, 956, 76-E8 (1987)

MAHONEY, W. A. Gamma-Ray Burst Localization by HEAO 3. R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson. *317*, 846, 75-C7 (1987)

MALEY, PAUL D. Specular Satellite Reflection and the 1985 March 19 Optical Outburst in Perseus. Paul D. Maley. *317*, L39, 71-C13 (1987)

MALHERBE, J. M. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado. *317*, 956, 76-E8 (1987)

MANDOLESI, N. Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. R. B. Partidge, R. A. Perley, N. Mandolesi, and F. Delpino. *317*, 112, 65-B11 (1987)

MARGON, B. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Levreault. *317*, 355, 67-F14 (1987)

MARR, J. Study of the H42α (86 GHz) Recombination Line in W3(OH). Wm. J. Welch and J. Marr. *317*, L21, 71-B12 (1987)

MASSON, C. R. Molecular Spiral Structure in M51. K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody. *317*, L63, 78-B11 (1987)

MATHIS, JOHN S. On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. Michael Rosa and John S. Mathis. *317*, 163, 65-F11 (1987)

MAZEH, TSEVI. Photometry of SS 433 over 7 Years: Study of Two Periodicities. Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson. *317*, 824, 75-A13 (1987)

MCCOOK, G. P. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. *317*, L29, 71-C4 (1987)

MCCRAY, RICHARD. Supershells and Propagating Star Formation. Richard McCray and Minas Kafatos. *317*, 190, 66-B1 (1987)

Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. Timothy R. Kallman, Richard McCray, and G. Mark Voit. *317*, 746, 74-B12 (1987)

Inside Supernova 1987A. Richard McCray, J. Michael Shull, and Peter Sutherland. *317*, L73, 78-C7 (1987)

McMILLAN, R. S. Evidence for Periodic Radial Velocity Variations in Arcturus. P. H. Smith, R. S. McMillan, and W. J. Merline. *317*, L79, 78-C12 (1987)

MEECH, KAREN J. Surface Brightness Profiles of 10 Comets. D. C. Jewitt and Karen J. Meech. *317*, 992, 77-A7 (1987)

MENDELSON, HAIM. Photometry of SS 433 over 7 Years: Study of Two Periodicities. Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson. *317*, 824, 75-A13 (1987)

MENINGER, HERBERT. Photometry of SS 433 over 7 Years: Study of Two Periodicities. Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson. *317*, 824, 75-A13 (1987)

MERLINE, W. J. Evidence for Periodic Radial Velocity Variations in Arcturus. P. H. Smith, R. S. McMillan, and W. J. Merline. *317*, L79, 78-C12 (1987)

MIELBRECHT, RICHARD A. Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt. *317*, 787, 74-F1 (1987)

MISKA, DOMINIQUE. Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. Edouard Miska and Dominique Miska. *317*, 282, 67-A7 (1987)

MISKA, EDOUARD. Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. Edouard Miska and Dominique Miska. *317*, 282, 67-A7 (1987)

MIYAJI, TAKESHI. Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shinichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. *317*, L111, 78-E14 (1987)

MIYAMA, SHOKEN M. The Equilibria of Rotating Isothermal Clouds. Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi. *317*, 830, 75-B5 (1987)

MÖBIUS, E. The Mean Ionic Charge of Silicon in ³He-rich Solar Flares. A. Luhn, B. Klecker, D. Hovestadt, and E. Möbius. *317*, 951, 76-E2 (1987)

MOLTENI, D. The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. M. Morini, N. A. Lipani, and D. Molteni. *317*, 145, 65-E3 (1987)

MORBEY, C. L. On the Reality of Certain Spectroscopic Orbits. C. L. Morbey and R. F. Griffin. *317*, 343, 67-F1 (1987)

MORIARTY-SCHIEVEN, G. H. CS Observations of L1551: No Rotating Disk. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdalen. *317*, L95, 78-D13 (1987)

MORIMOTO, MASAKI. Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shinichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. *317*, L111, 78-E14 (1987)

MORINI, M. The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. M. Morini, N. A. Lipani, and D. Molteni. *317*, 145, 65-E3 (1987)

MORRIS, SIMON L. The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnshek. *317*, 450, 68-G10 (1987)

MOULD, J. Isophotal Diameters of Cluster Spirals (Abstract of Paper in

1987 July Suppl.). *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mousd.* 317, 1002, 77-B5 (1987)

MULLAN, D. J. Velocity Fields in a Low-Latitude Coronal Hole: Results from the Solar Maximum Mission. *D. J. Mullan and W. L. Waldron.* 317, 487, 69-C5 (1987)

MURISON, M. A. Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison.* 317, 290, 67-B1 (1987)

MUSHOTZKY, R. Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky.* 317, 593, 72-E11 (1987)

NARITA, SHINJI. The Equilibria of Rotating Isothermal Clouds. *Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi.* 317, 830, 75-B5 (1987)

NASSIOPoulos, G. E. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn.* 317, L86, 78-D4 (1987)

NOLTHENIUS, RICHARD. Dynamics of the Outer Disk and Halo of M31. *Richard Nolthenius and Holland C. Ford.* 317, 62, 64-E13 (1987)

NOMOTO, KEN'ICHI. On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. *Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambé, and Alexander V. Tutukov.* 317, 717, 73-G11 (1987)

NORDSIECK, K. H. Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison.* 317, 290, 67-B1 (1987)

O'DELL, C. R. Statistical Equilibrium in Cometary C₂. IV. A 10 Level Model Including Singlet-Triplet Transitions. *K. S. Krishna Swamy and C. R. O'Dell.* 317, 543, 69-G7 (1987)

Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda.* 317, 676, 73-D10 (1987)

Evidence for Turbulence in H II Regions. *C. R. O'Dell and Hector O. Castañeda.* 317, 686, 73-E6 (1987)

Spectrophotometry of Comets Giacobini-Zinner and Halley. *Stephen C. Telegar and C. R. O'Dell.* 317, 987, 77-A2 (1987)

OHISHI, MASATOSHI. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito.* 317, L111, 78-E14 (1987)

Laboratory Detection and Astronomical Identification of a New Free Radical, CCS(³Σ). *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu.* 317, L115, 78-F3 (1987)

Laboratory Detection of a New Carbon-Chain Molecule C₃S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi.* 317, L119, 78-F7 (1987)

Laboratory Detection and Astronomical Identification of a New Free Radical, CCS(³Σ). *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu.* 317, L115, 78-F3 (1987)

Laboratory Detection of a New Carbon-Chain Molecule C₃S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi.* 317, L119, 78-F7 (1987)

ORLATI, MARIA ANTONIETTA. On the Source of the Violet Depression in Carbon Stars: A Study of the Balmer Decrement in Carbon Long-Period Variables. *Maria Antonietta Orlati.* 317, 819, 75-A6 (1987)

PACZYŃSKI, BOHDAN. Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński.* 317, 11, 64-B3 (1987)

Gravitational Microlensing and Gamma-Ray Bursts. *Bohdan Paczyński.* 317, L51, 78-B1 (1987)

PALMA, AMEDEO. Collisional Excitation of Interstellar Sulfur Dioxide (Abstract of Paper in 1987 July Suppl.). *Amedeo Palma.* 317, 1003, 77-B6 (1987)

PARTIDe, R. B. Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partidge, R. A. Perley, N. Mandoloni, and F. Delpino.* 317, 112, 65-B11 (1987)

PEEBLES, P. J. E. A Fluid Model for the Evolution of Large-Scale Structure. *P. J. E. Peebles.* 317, 576, 72-D8 (1987)

The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. *M. E. Brown and P. J. E. Peebles.* 317, 588, 72-E6 (1987)

PELLAT, R. On the Antonov Criterion for Gravothermal Instability. *J. F. Luciani and R. Pellat.* 317, 241, 66-E8 (1987)

PERAIAH, A. Aberration and Advection Effects in a Plane-parallel Medium in Motion. *A. Peraiyah.* 317, 271, 66-G10 (1987)

PERLEY, R. A. Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partidge, R. A. Perley, N. Mandoloni, and F. Delpino.* 317, 112, 65-B11 (1987)

PESNELL, W. DEAN. Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell.* 317, 303, 67-B14 (1987)

PETERS, W. L. The Correlation of Spiral Arm Molecular Clouds with Cold Atomic Hydrogen. *W. L. Peters and F. N. Bash.* 317, 646, 73-B8 (1987)

PHILLIPS, T. G. Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody.* 317, L63, 78-B11 (1987)

PLAMBECK, R. L. Aperture Synthesis Maps of HDO Emission in Orion-KL. *R. L. Plambeck and M. C. H. Wright.* 317, L101, 78-E4 (1987)

PRINJA, RAMAN K. Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. *Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs.* 317, 389, 68-B11 (1987)

ROGERS, C. Thermal Emission from Bok Globules. *Man Hoi Lee and C. Rogers.* 317, 197, 66-B8 (1987)

ROSA, MICHAEL. On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. *Michael Rosa and John S. Mathis.* 317, 163, 65-F11 (1987)

SAITO, SHUJI. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito.* 317, L111, 78-E14 (1987)

Laboratory Detection and Astronomical Identification of a New Free Radical, CCS(³Σ). *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu.* 317, L115, 78-F3 (1987)

Laboratory Detection of a New Carbon-Chain Molecule C₃S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi.* 317, L119, 78-F7 (1987)

SALPETER, E. E. 1.4 GHz Continuum Sources in the Cancer Cluster. *E. E. Salpeter and J. M. Dickey.* 317, 102, 65-B1 (1987)

SANDAGE, ALLAN. The Redshift-Distance Relation. IXa. Reinterpretation of the Local Group Deceleration Data Emphasizing the Kahn-Wolter Mass Determination. *Allan Sandage.* 317, 557, 72-C1 (1987)

SCHLEGEL, ERIC M. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydreae. *Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiots Kakaletris, R. Kent Honeycutt, and Eric M. Schlegel.* 317, 765, 74-D3 (1987)

SCHMIEDER, B. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. *B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado.* 317, 956, 76-E8 (1987)

SCHNACK, D. D. Nonlinear Radiative Condensation in a Sheared Magnetic Field. *G. Van Hoven, L. Sparks, and D. D. Schnack.* 317, L91, 78-D9 (1987)

SCHWARTZ, R. A. Gamma-Ray Burst Localization by HEAO 3. *R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson.* 317, 846, 75-C7 (1987)

SCHWARZSCHILD, M. Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. *P. T. de Zeeuw, C. Hunter, and M. Schwarzschild.* 317, 607, 72-F11 (1987)

SCOTT, S. Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody.* 317, L63, 78-B11 (1987)

SCOVILLE, N. Z. Radial Velocities of Late-Type Stars in the Galactic Center. *K. Sellgren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville.* 317, 881, 75-F5 (1987)

SEAQUIST, E. R. A Radio Survey of Symbiotic Stars: Erratum. *E. R. Seaquist, A. R. Taylor, and S. Sutton.* 317, 555, 70-A5 (1987) (Orig. paper in 284, 202, 100-C7)

SELLGREN, K. Radial Velocities of Late-Type Stars in the Galactic Center. *K. Sellgren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville.* 317, 881, 75-F5 (1987)

SHAWL, STEPHEN J. Axial Ratios and Orientations for 100 Galactic Globular Star Clusters. *Raymond E. White and Stephen J. Shawl.* 317, 246, 66-E13 (1987)

SHIELDS, G. A. The Composition Gradient across M81. *D. R. Garnett and G. A. Shields.* 317, 82, 64-G7 (1987)

SHULL, J. MICHAEL. Inside Supernova 1987A. *Richard McCray, J. Michael Shull, and Peter Sutherland.* 317, L73, 78-C7 (1987)

SILK, JOSEPH. Does Lower Ω Allow a Resolution of the Large-Scale Structure Problem? *Joseph Silk and Nicola Vittorio.* 317, 564, 72-C8 (1987)

SMITH, DAVID. On the Synthesis of c-C₆H₆ in Interstellar Clouds. *Nigel G. Adams and David Smith.* 317, L25, 71-C1 (1987)

SMITH, HARDING E. Spectrophotometry of Six Broad Absorption Line QSOs. *Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith.* 317, 460, 69-A7 (1987)

SMITH, P. H. Evidence for Periodic Radial Velocity Variations in Arcturus. *P. H. Smith, R. S. McMillan, and W. J. Merline.* 317, L79, 78-C12 (1987)

SMOOT, GEORGE F. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc*

Bensadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky. 317, L45, 78-A9 (1987)

SNELL, R. L. CS Observations of L1551: No Rotating Disk. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdalen. 317, L95, 78-D13 (1987)

SOFIA, SABATINO. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. Frederick C. Bruhwiler, Daniel A. Klinglesmith III, Theodore R. Gull, and Sabatino Sofia. 317, 152, 65-E11 (1987)

SONNEBORN, G. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn. 317, L86, 78-D4 (1987)

SPARKS, L. Nonlinear Radiative Condensation in a Sheared Magnetic Field. G. Van Hoven, L. Sparks, and D. D. Schnack. 317, L91, 78-D9 (1987)

STABELL, R. The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. Paul S. Wesson, K. Valle, and R. Stabell. 317, 601, 72-F5 (1987)

STANG, P. D. A New Constraint on the Galactic Plane ^{26}Al Distribution. C. J. MacCullum, A. F. Huters, P. D. Stang, and M. Leventhal. 317, 877, 75-F1 (1987)

STARRFIELD, SUMNER G. Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell. 317, 303, 67-B14 (1987)

STEWART, A. I. Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps. 317, 964, 76-F5 (1987)

STRAW, S. M. A Near-Infrared Study of the NGC 6334-IV Region. P. M. Harvey, A. R. Hyland, and S. M. Straw. 317, 173, 65-G8 (1987)

STROM, S. E. CS Observations of L1551: No Rotating Disk. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdalen. 317, L95, 78-D13 (1987)

STRUBLE, MITCHELL F. Alignment Statistics of Clusters with Their Brightest Members at Bright and Faint Isophotes. Mitchell F. Struble. 317, 668, 73-D2 (1987)

SUTHERLAND, PETER. Inside Supernova 1987A. Richard McCray, J. Michael Shull, and Peter Sutherland. 317, L75, 78-C7 (1987)

SUTTON, A. R. A Radio Survey of Symbiotic Stars: Erratum. E. R. Sequist, A. R. Taylor, and S. Sutton. 317, 555, 70-A5 (1987) (Orig. paper in 284, 202, 100-C7)

SUZUKI, HIROKO. Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shinichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. 317, L111, 78-E14 (1987)

Laboratory Detection and Astronomical Identification of a New Free Radical, $\text{CCS}({}^3\Sigma^-)$. Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu. 317, L115, 78-F3 (1987)

Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi. 317, L119, 78-F7 (1987)

TANIGUCHI, YOSHIAKI. Blueward Asymmetrical Emission-Line Profiles of a Starburst-Nucleus Galaxy Markarian 52. Yoshiaki Taniguchi. 317, L57, 78-B6 (1987)

TARBELL, T. D. On the Relation between Magnetic Field Structures and Granulation. A. M. Title, T. D. Tarbell, and K. P. Topka. 317, 892, 75-G3 (1987)

TAYLOR, A. R. A Radio Survey of Symbiotic Stars: Erratum. E. R. Sequist, A. R. Taylor, and S. Sutton. 317, 555, 70-A5 (1987) (Orig. paper in 284, 202, 100-C7)

TEGLER, STEPHEN C. Spectrophotometry of Comets Giacobini-Zinner and Halley. Stephen C. Tegler and C. R. O'Dell. 317, 987, 77-A2 (1987)

TEKEUCHI, HIDEO. Viscosity of Dense Matter. Naoki Itoh, Yasuharu Kohyama, and Hideo Tekeuchi. 317, 733, 74-A13 (1987)

TELESCO, C. M. Star Formation in the Magellanic Irregular Galaxy NGC 4449. Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher. 317, 180, 66-A3 (1987)

THOMAS, G. E. Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps. 317, 964, 76-F5 (1987)

THONSON, HARLEY A., JR. Star Formation in the Magellanic Irregular Galaxy NGC 4449. Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher. 317, 180, 66-A3 (1987)

TITLE, A. M. On the Relation between Magnetic Field Structures and Granulation. A. M. Title, T. D. Tarbell, and K. P. Topka. 317, 892, 75-G3 (1987)

TOMIMURA, NAZIRA. Inhomogeneous Cosmological Models: New Exact Solutions with Dust, Isotropic Radiation, and Electromagnetic Field. Nazira Tomimura and Ioav Waga. 317, 52, 64-E2 (1987)

TOPKA, K. P. On the Relation between Magnetic Field Structures and Granulation. A. M. Title, T. D. Tarbell, and K. P. Topka. 317, 892, 75-G3 (1987)

TORNAMBÈ, AMEDEO. On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. Icko Iben, Jr., Ken'ichi Nomoto, Amadeo Tornambè, and Alexander V. Tutukov. 317, 717, 73-G11 (1987)

TOWNSLEY, L. K. Fine-Scale Motion in NGC 6514 and NGC 6523. C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda. 317, 676, 73-D10 (1987)

TURNSEK, DAVID A. The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnsek. 317, 450, 68-G10 (1987)

TUTUKOV, ALEXANDER V. On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. Icko Iben, Jr., Ken'ichi Nomoto, Amadeo Tornambè, and Alexander V. Tutukov. 317, 717, 73-G11 (1987)

UOMOTO, A. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. 317, 355, 67-F14 (1987)

VADER, J. PATRICIA. Metal-enhanced Galactic Winds. II. Radiative Cooling and Pressure Effects. J. Patricia Vader. 317, 128, 65-C14 (1987)

VALLE, K. The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. Paul S. Wesson, K. Valle, and R. Stabell. 317, 601, 72-F5 (1987)

VALLEÉ, J. P. Sulfur, Carbon, Helium, and Hydrogen 125 α Observations and Physical Analysis of the W48 Neutral Interface. J. P. Vallée. 317, 693, 73-E13 (1987)

VAN HOVEN, G. Nonlinear Radiative Condensation in a Sheared Magnetic Field. G. Van Hoven, L. Sparks, and D. D. Schnack. 317, L91, 78-D9 (1987)

VITTORIO, NICOLA. Does Lower Ω Allow a Resolution of the Large-Scale Structure Problem? Joseph Silk and Nicola Vittorio. 317, 564, 72-C8 (1987)

VOIT, G. MARK. Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. Timothy R. Kallman, Richard McCray, and G. Mark Voit. 317, 746, 74-B12 (1987)

VRBA, F. J. Shock-Front Compression of the Magnetic Field in the Canis Major RI Star Formation Region. F. J. Vrba, R. Baierlein, and W. Herbst. 317, 207, 66-C4 (1987)

WACKER, S. W. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. 317, L29, 71-C4 (1987)

WADEHRA, J. M. The Hydrogen Molecular Ion in an Arbitrary Homogeneous Magnetic Field. D. R. Brigham and J. M. Wadehra. 317, 865, 75-D14 (1987)

WAGA, IOAV. Inhomogeneous Cosmological Models: New Exact Solutions with Dust, Isotropic Radiation, and Electromagnetic Field. Nazira Tomimura and Ioav Waga. 317, 52, 64-E2 (1987)

WAGNER, A. F. Oxygen Chemistry of Shocked Interstellar Clouds. I. Rate Constants for Thermal and Nonthermal Internal Energy Distributions. A. F. Wagner and M. M. Graff. 317, 423, 68-E11 (1987)

WALDRON, W. L. Velocity Fields in a Low-Latitude Coronal Hole: Results from the Solar Maximum Mission. D. J. Mullan and W. L. Waldron. 317, 487, 69-C5 (1987)

WALLACE, RICHARD K. The Core Helium Flash and Surface Abundance Anomalies. Robert G. Deupree and Richard K. Wallace. 317, 724, 74-A4 (1987)

WALLERSTEIN, GEORGE. Carbon (${}^{12}\text{C}/{}^{13}\text{C}$) and Oxygen (${}^{16}\text{O}/{}^{17}\text{O}$) Isotopic Ratios in Seven Evolved Stars. James F. Dominy and George Wallerstein. 317, 810, 74-G11 (1987)

WEBBER, W. R. Interplanetary Radial Cosmic-Ray Gradients and Their Implication for a Possible Large Modulation Effect at the Heliospheric Boundary. W. R. Webber and J. A. Lockwood. 317, 534, 69-F11 (1987)

WEBSTER, RACHEL. Substructure in the Coma Cluster. Michael Fitchett and Rachel Webster. 317, 653, 73-C1 (1987)

WELCH, DOUGLAS L. Spectroscopy and JHK Photometry of Type II Cepheids in the Magellanic Clouds. Douglas L. Welch. 317, 672, 73-D6 (1987)

WELCH, WM. J. Study of the H42 α (86 GHz) Recombination Line in W3(OH). Wm. J. Welch and J. Marr. 317, L21, 71-B12 (1987)

WENTZEL, DONAT G. Solar Oscillations: A Method for Deriving Nonlinear Effects. *Donat G. Wentzel*. 317, 477, 69-B10 (1987)

WESSON, PAUL S. The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell*. 317, 601, 72-F5 (1987)

WESTERN, L. R. Cylindrical Astrophysical Maser Models: Polarization Due to Magnetic Fields. *L. R. Western*. 317, 858, 75-D7 (1987)

WEYMANN, RAY J. The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. *Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnshek*. 317, 450, 68-G10 (1987)

WHEELER, J. C. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Levreault*. 317, 355, 67-F14 (1987)

WHITE, RAYMOND E. Axial Ratios and Orientations for 100 Galactic Globular Star Clusters. *Raymond E. White and Stephen J. Shawl*. 317, 246, 66-E13 (1987)

WITEBSKY, CHRIS. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky*. 317, L45, 78-A9 (1987)

WOODY, D. P. Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody*. 317, L63, 78-B11 (1987)

WOOTTEN, ALWYN. L1689N: Misalignment between a Bipolar Outflow and a Magnetic Field. *Alwyn Wootten and R. B. Loren*. 317, 220, 66-D1 (1987)

WRIGHT, M. C. H. Aperture Synthesis Maps of HDO Emission in Orion-KL. *R. L. Plambeck and M. C. H. Wright*. 317, L101, 78-E4 (1987)

YAMAMOTO, SATOSHI. Laboratory Detection and Astronomical Identification of a New Free Radical, $\text{CCS}^3\Sigma^-$. *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaiju*. 317, L115, 78-F3 (1987)

YAMAMOTO, SATOSHI. Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaiju, Hiroko Suzuki, and Masatoshi Ohishi*. 317, L119, 78-F7 (1987)

YEPES, G. Antimatter and Light Element Yields: Could Dark Matter be Baryonic? *R. Dominguez-Tenreiro and G. Yepes*. 317, L1, 71-A4 (1987)

YOUNG, ARTHUR. Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. *Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt*. 317, 787, 74-F1 (1987)

ZWEIBEL, ELLEN G. The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. *Tzihong Chiueh and Ellen G. Zweibel*. 317, 900, 76-A7 (1987)